

## COMPARTMENT SYNDROME IN TIBIAL SHAFT FRACTURE MISSED BECAUSE OF A LOCAL NERVE BLOCK

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Compartment syndrome is a serious complication of fractures of the tibial shaft and its clinical presentation and evaluation have been well documented (Holden 1975; Kikuchi, Hasue and Watanabe 1978). The most important diagnostic feature is the presence of inappropriate pain even after stabilisation of the fracture by a cast or by external or internal fixation. Pain is made worse by passive stretching of the muscles involved and there is an associated sensory disturbance. The prognosis is directly related to the speed at which the diagnosis is made and treatment begun. It has been shown that muscle can tolerate only four hours of ischaemia without injury (Heppenstall et al 1988; Heckman et al 1993).

We describe a patient with a fracture of the tibial shaft in whom the diagnosis of compartment syndrome was delayed because of the use of a local nerve block given in the operating theatre after intramedullary nailing.

**Case report.** A 28-year-old man presented after a football injury with a closed fracture of the tibial shaft (42-A2.2 according to the AO classification (Müller et al 1990)). Before operation there were no signs of neurovascular compromise or of a compartment syndrome. The fracture was initially stabilised in a plaster back slab and closed, unreamed locked intramedullary nailing then performed. At the end of the operation, the patient was given a triple nerve block (femoral, obturator, lateral cutaneous nerve of thigh) using bupivacaine 0.5% for pain control.

After operation, he was entirely free from pain, although he did complain of areas of altered sensation in his foot and leg, but these varied in site and were initially thought to be a result of the nerve block rather than a symptom of a developing compartment syndrome.

Pressure measurements were made 48 hours after operation because symptoms persisted and there was inability actively to extend the big toe. They showed a pressure of 108 mmHg in the anterior compartment. We performed fasciotomy urgently but all the muscles in the anterior compartment were dead. No other compartment was involved. The whole of the anterior tibial compartment was debrided 48 hours later as there was no sign of recovery. The patient now walks with an orthosis.

**Discussion.** The treatment of postoperative pain in patients whose tibial fractures have been stabilised is usually by elevation of the injured leg and the use of oral or intramuscular analgesics, especially non-steroidal anti-inflammatory agents. Local anaesthetic nerve blocks are now also commonly given to patients with fractures of the lower limb; they are effective and especially useful after fracture of the femoral shaft. A nerve block using bupivacaine persists for about eight hours (Macrae and Davies 1993), but recovery from the block may be patchy and erratic over a period of several hours.

The diagnosis of compartment syndrome is essentially clinical on the basis of inappropriate pain, made worse by passive stretching of the affected muscles, together with sensory changes in the leg. A local nerve block masks both the symptoms and the physical signs making the diagnosis extremely difficult.

In our patient, the delay in diagnosis was critical. An important lesson was learned at the expense of a tragedy. First, nerve blocks should not be used when there is a possibility of a compartment syndrome. Secondly, in doubtful cases intracompartmental pressure measurement is indispensable and should be performed early (Whitesides et al 1975; Mubarak et al 1976; Heckman et al 1994; McQueen, Christie and Court-Brown 1996). Fasciotomy is indicated if the peak compartment pressure is within 20 mmHg of the diastolic blood pressure (Heckman et al 1994; McQueen and Court-Brown 1996).

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